For Teachers, Wired Classrooms Pose New Management Concerns
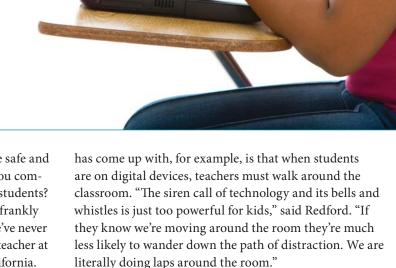
In a growing number of K-12 schools, the use of 1-to-1 computing devices—including iPads, laptops, and Chromebooks—is becoming a central part of instruction. For teachers making the digital leap, one of the greatest hurdles can be figuring out how to manage the tech-infused classroom.

By Liana Heitin

How do you ensure the devices are safe and well-maintained? And how do you compete with your most tech-savvy students? "I think this is the new frontier frankly with classroom management. We've never confronted this," said Kyle Redford, a fifth-grade teacher at Marin Country Day School in Corte Madera, California.

Redford's school introduced iPads in the middle grades three years ago. "I think we were a little wide-eyed and naïve initially. We were letting students guide the exploration into technology," she said.

While district firewalls and pre-loaded applications are certainly helpful in keeping kids on task, they are far from foolproof. Educators generally need to take additional measures to prevent students from straying.

Perhaps the most stringent guidance Redford's school has come up with, for example, is that when students are on digital devices, teachers must walk around the classroom. "The siren call of technology and its bells and whistles is just too powerful for kids," said Redford. "If they know we're moving around the room they're much less likely to wander down the path of distraction. We are literally doing laps around the room."

Sherly Chavarria, a fifth-grade teacher at National Teachers Academy, a public school in Chicago, noted that iPads can be a bit easier to monitor than laptops because they lay flat on the desk. When her school began using Chromebook laptops last year, "I had to keep walking back and forth to make sure they weren't clicking tabs," she said. "At moments too many students were off task in too short a time, so I took the Chromebooks away for a week. We had conversations about how tools are there to

support our learning, not distract our learning."

Christine Taylor, instruction technology liaison at Howard University Middle School of Mathematics and Science (MS)², updates software on laptops during a sixth-grade STEM Literacy class.

This year, she's piloting Hapara for her school, a computer dashboard that, among other things, allows her to see all of her students' desktops at once and open and close tabs on their computers from afar.

At Howard University Middle School of Mathematics and Science, or (MS)², a charter school in the District of Columbia, this kind of remote desktop software is a critical component of instruction. The 300 students at the school, which receives financial support from nearby Howard University, all have laptops both at home and in each of their classrooms. During a recent class, Wesley Ellis, an eighth-grade social studies teacher, used the desktop program to keep an eye on students' work as they annotated a National Geographic video at their own pace. "After the first month or two, it's so easy to have kids working independently on the laptops," he said. "They know the expectations."

Create a Sense of Value

One of the best ways to keep devices in good condition, teachers seem to agree, is by creating a sense of value around them. Taylor said she began the school year by making sure "the students understood what a privilege it was to have a classroom laptop and that not all schools had that." She added, "This goes for anything—if the teacher makes it important, then it becomes important to the students."

In rolling out the Chromebooks, Chavarria talked to her classes about "what it means to be early adopters and tech pioneers. It creates a sense of pride in students." She also developed specific lesson plans around maintenance and care since Chromebooks are "easily damaged," she said. "I did a whole lesson on how to carry them, open them, how to turn them to show a partner. I can hold students accountable if I taught them how to do it."

In her first year of using Chromebooks, Chavarria said, two screens broke. Now, she keeps a broken device to show to her classes. "We role-play the scenario exactly as it happened—a student was excited to show another student and grabbed it by the screen and turned it," she said. "We talk about how to show it to another student."

Another management practice common to many tech-infused classrooms is ensuring that students receive the same device every day. Chavarria said that each Chromebook and each desk in her classroom have a number, and students' assigned computers do not change.

Rebecca Christian, a sixth-grade teacher at (MS)², numbers her computers as well and holds her students accountable for their particular laptop's upkeep. "They know, as soon as you turn it on, if you've got a problem, you've got to let a teacher know. Otherwise, you're assumed responsible," she said.

Taylor encourages teachers to keep track of which computers are out for repairs as well, and who has what computer in the meantime. For her, this system "increased the level of student responsibility. I knew that if a key was flicked off the computer, I could easily trace it back to who had been on that computer that day."

(MS)² also keeps its devices—and middle school students—safe by forbidding students from transporting laptops. Students keep the personal Macbooks they're issued at home for homework and use the classroom laptops while at school. If a home laptop "needs to be serviced, a parent must bring that laptop in," said Taylor. "In D.C., most students take public transportation, so in order to maintain safety for them, we don't want them to carry it for service." This also prevents mishaps in which the laptops are dropped or damaged en route.

At Redford's school, students receive personal iPads in fifth grade but cannot begin taking them home until sixth-grade. The graduated responsibility allows students to "get good at taking care of their iPads," she said.

Officials in the Los Angeles school district, which conducted a mass iPad rollout this year, discovered the risks of allowing students to take devices off campus the hard way, when 71 iPads went missing and 300 students hacked through security filters once outside the district firewall. Superintendent John Deasy has since put a moratorium on letting students transport the devices.

Putting Students in Charge

Appointing a student technology monitor can also ease logistical issues. In Chavarria's classroom, she said, "There are two students who pass [the Chromebooks] out in the morning. There's no conversation about it. It's the same with pickup."

Robert Pronovost, the STEM coordinator for the Ravenswood City school district, said that putting maintenance tasks in the hands of students was one of the biggest changes "from the beginning to where I felt

> "As in any classroom setting, the thorniest management problems often arise from the cleverest students. Instead of trying to restrain these students' efforts, many teachers recommend harnessing their know-how and curiosity."

successful" implementing 1-to-1 devices. "Going from me being responsible for getting everything charged every night to having the tech monitor going back and checking to make sure everything is plugged in and in the right place" made an enormous difference, he said. "It's the small things the tech monitor does, like jiggling plugs that hadn't gotten plugged in all the way."

Most teachers have a cart or cabinet that can charge a classful of laptops or iPads overnight, often a key resource because classrooms tend to lack outlets. Even with the carts, however, teachers will inevitably be faced with devices running out of battery power during a lesson at some point, so having set procedures for such situations is important. At (MS)[2], Christian's sixth-graders know to head toward a charging station at the back of the room if their laptop dies.

According to Krista Moroder, the K-12 technology integrator for the 4,300-student Kettle Moraine school district in Wales, Wisconsin, it's important to have charging stations and a "classroom design where cords aren't being tripped over." Flexible seating, in which students are allowed to move with their devices as needed, can be helpful in solving this problem, she explained.

Like electrical cords, headphones can also pose problems. In Ellis' classroom at (MS)[2], students return headphones to their original plastic packaging after each use, which both serves as protection and keeps the wires out of the way. Pronovost said he's tried a variety of systems for keeping headphones safe and untangled, including having students wrap them around their iPods and putting them in their desks around a small piece of cardboard. He eventually settled on having kids hang headphones "on the wall with a hook with every student's name."

Teach Tech Terms

Many teachers with classroom laptops find it helpful to differentiate between words like "closed" and "signed out,"

and to be clear about what state the computer should be in at any given moment. "If I'm going to do brief direct instruction, I tell them to close the Chromebooks," said Chavarria, meaning they should fold down the tops. "They only have it open if we're doing a task they need to follow. ...They know the difference between closing and signing out."

In Ellis' room recently, one student scolded another for closing the screen rather than signing out during a question-and-answer session after the video. "He said shut it down," 13-year-old Stephon Greene reminded his classmate.

Teachers seem to agree that another key to managing the digital classroom—akin to having an organized system for passing out papers—is using cloud tools to share documents. Programs like Google Drive, Evernote, and Dropbox allow teachers to put an assignment or instructions in every student's folder at once. Cloud tools also let teachers "track student work from the time they start to the time they finish," said Wisconsin school technology integrator Moroder. "And having 24/7 access makes it easier because you know whether or not students are focused."

As in any classroom setting, the thorniest management problems often arise from the cleverest students. Instead of trying to restrain these students' efforts, many teachers recommend harnessing their know-how and curiosity. "Our biggest tech-savvy kid, he was cracking codes on passwords and getting into all kinds of trouble," said Redford. So the technology department "hired him for the summer to explore every crack in our system and expose it and they paid him. He was able to identify and come up with solutions."

Pronovost takes the idea a step further and has students "who really understand how technology is supposed to be used" create videos of themselves demonstrating tech tools. He then puts the instructional video in a shared Dropbox folder so students can return to it at any time. This not only prevents him from having to re-explain the technology but it also empowers students and "adds to the shared ownership," he said. ∎

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National School Choice Week Wrap-Up

Last week, teachers, students, and administrators across the country celebrated National School Choice Week. These pictures capture AAE's efforts to celebrate teachers' professional choices.

10 Inexpensive Spring Break Ideas

Looking for great spring break ideas, without breaking your wallet? Here are ten ideas for making the most of your spring break, and your budget.

1. Quit cold turkey on work for a few days

Studies show that a little break from work will actually make you a better teacher. Taking some time away will leave you with fresh ideas and renewed energy for the long stretch until summer.

2. Have a staycation

Whether you live in a large city, a small suburb, or somewhere in between, there is bound to be some unchartered territory near you. Instead of going on an expensive trip, save money and explore your own backyard (probably not literally).

3. Spend some time in nature

As the frost of winter beings to thaw, take advantage of the warm(er) weather. Go on a hike, bike ride, boat ride, or walk, and allow nature to inspire and relax you.

4. Go shopping

You are saving money by staying home, why not spruce up your wardrobe, classroom, or house with a few new items? Your students will probably thank you for wearing something new or bringing something new into the classroom.

5. Make something

Cook, knit, plant a garden, construct that much-needed book shelf for your classroom—make something to remind you of spring break 2014 for the rest of the year.

6. Start planning your summer

It's never too early to start planning for summer. Make a list of the projects you want to accomplish, the trips you want to go on, the books you want to read. The list will motivate you to finish the year strong and make it to summer.

7. Engage/indulge a little in pop culture

Better understand the next generation by partaking in some pop-culture pastimes. Whether it's the newest season of *American Idol*, or catching up on the latest Oscar-nominated movie, take some time to understand what your students are watching and listening to—it could be more insightful than you think.

8. Do something to develop yourself professionally

Without breaking number one, do something that will make you a better professional. Read up on the latest studies in your subject, catch up on recent education reports, or read your backlogged editions of *Education Matters*.

9. Read a book

Check our blog for book recommendations, the latest edition of *PD Matters*, professional development eBlast, or your local library for book ideas.
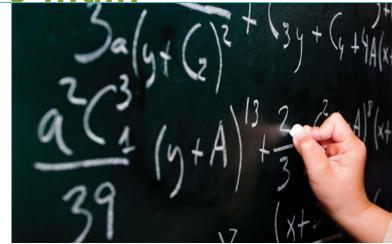
10. Pamper yourself

Get that haircut you've been needing since last spring break, get a manicure, pedicure or massage—do something to make you feel refreshed as you go into the last few months of the year. ■

By Lane Walker

Changes in our Math Students Progressing through the Common Core Math

While political and testing controversies surround the adoption of Common Core State Standards (CCSS), and while these controversies often generate interesting discussions, I have found far more useful insights by studying the math standards themselves, along with their progressions. I see great potential for the Standards to rectify many issues our country has with respect to mathematics instruction.

Every year, when I begin fall classes, my freshmen students struggle with fractions and integers. "Do I put a one under the three and cross-multiply with the 4 and the 7, or do I multiply straight across?" Or for integers, "Is it keep-change-opposite?" It takes me months of daily redirection to untangle the confusion and get my ninth graders to connect math symbols with logical reasoning. Until the Common Core made its way into general awareness among math teachers, it was not uncommon for a teacher to say, "I never understood all the concepts and underlying connections, so why should we try to teach all that to the kids? I just show them what to do. It's much easier for them." With the Core's emphasis on mathematical reasoning, most districts that implement these standards will undergo radical change.

My district has introduced its teachers to the high school released items from Smarter Balanced. I can see that focused, analytical problem-solving skills, not just memorized procedures, need to be developed. I can also see that there will need to be dramatic changes in how I teach, what I teach, and what I should expect from students. Student attitudes prescribed in the Standards for Mathematical Practice (SMP) would be a great improvement, and our professional learning communities (PLC) have begun to strategize how we can change teaching practices and expectations to pull our students to higher levels, and our district has begun requiring that we submit reflections of new Kagan cooperative learning structures we use. I am already impressed with the increased enthusiasm for learning my students are exhibiting. Developing productive work groups and activities is becoming my new passion, and my students are beginning to associate their class work with realistic employment situations. My lectures are becoming shorter,

and students are learning analysis through discussion. They are also retaining better.

Last year I discovered one of the great strengths of the math standards is the way they empower me to remediate students many grade levels later because the operations are connected from one kind of number to another. In our discussions, my freshmen are amazed to learn that 3 x 2/7 is "three times as many" sevenths. They quickly catch on that every fraction is a sum of unit fractions: 2/7 = 1/7 + 1/7, so if I triple two sevenths, it makes sense without having to "put a one under the two and then multiply straight across." Using the commutative property to add mixed numbers like 3 1/2 + 4 1/2 as 3 + 4 + 1/2 + 1/2, my freshmen laugh at how much faster it is compared with automatically converting to improper fractions. Looking for the most efficient way to perform operations on messy numbers becomes a game of wit, and this helps students straighten out confusing memorized steps while at the same time intriguing more advanced students. Even students who have been successful with memorization appreciate how adding fractions with common denominators is related to adding "like terms," and both are related to adding decimal numbers by lining up place values (Why do we line up the decimal when we add?).

When it comes to connected logic, the math standards are ingenious. From kindergarten through high school, students are required to explain using arrays, area models, tape diagrams, charts, graphs, and more.

As I studied the references to area models throughout the standards, I noted how they connect addition with perimeter, and connect multiplication with area and scaling. Eventually the area models lead into multiplication of polynomials, factoring, and completing the square in algebra. Experience with using area models to explain mathematical connections makes each successive concept easier to understand. A description of area models through the grades can be downloaded from **tinyurl.com/areamodels**.

The Common Core Mathematics philosophy is geared toward moving most locally produced curriculum away from being a mile wide and an inch deep as compared with curriculum from higher-performing countries. The standards and progressions only hint, in most cases, at what exactly needs to go to make room for depth. Crucial moves from fraction-ratio progressions include proportional reasoning as opposed to "setting up and solving a proportion." Having students write equations $y=kx$ for scaling, percentages, rates of change, etc., takes a little more practice in the beginning, but that skill seamlessly connects with graphing and understanding linear equations, and is much more useful in the sciences.

In the upper levels, many memorized skills with limited application need to be tabled to allow time for students to fully master more extensible skills. For example, synthetic division that only works with certain kinds of roots, needs to be moved from Algebra II to a fourth year of math, if taught at all. Students need to re-memorize synthetic division procedures and limitations every year that topic appears in the curriculum, and college instructors tell us they still have to reteach it if they want students to use it. Long division does everything synthetic division does and much more. By tabling synthetic division, more instructional time can be spent developing the coherence with factors, quotients, and remainders. Some would argue synthetic division is faster when searching for roots, but strong long division skills, coupled with complete understanding of how roots present in a graphing utility, provide efficiency as well as coherent, retainable mathematical reasoning.

Memorized and confused laws of exponents prompt students to continually ask whether they should add exponents or multiply them. Students who thoroughly understand that exponents specify the number of factors of a base can easily re-establish the patterns of the laws themselves. Other helpful alternatives to confusing practices and shortcuts are being widely circulated in a document at **nixthetricks.com**. The compilation is open to comments and submissions, and I have enjoyed reading new discussions as they are added.

Some misunderstand the impact of changes like these on college readiness. Having taught at two colleges, I am well aware of the unbelievable percentages of students needing remedial math. I believe my students will be much better off upon graduation for each year of instruction they receive under the Common Core. As far as allowing 8th graders to take Algebra I, the same adjustments that have allowed for acceleration in the past will still be available, although fewer students are likely to be accelerated for two reasons. First, acceleration for many students has been too much too soon. Inappropriate acceleration has created a population of disaffected students who did not earn acceptable grades and lost confidence. They continue to do poorly in successive math classes. Secondly, the CCSS are structured to reach a broader range of achievers at each grade level. Students who only complete three years of high school math under the standards should at least be ready for community college. The fourth year of high school math will train students for more selective colleges including STEM majors. Since most students these days expect to take math every year in high school, most should be able to avoid remedial math classes when they enroll at college. According to Missouri Department of Education's website, only 16 percent of our state's high school freshmen are expected to obtain a four-year college degree by their early 20s. The site does not say how many of those degrees realistically lead to jobs. More often than not, lack of success in higher education can be attributed to inability to pass college math classes. A quick surf through employment recruiting sites shows thousands of unfilled jobs in our country with high unemployment, but too many of our workers do not have the skills to fill STEM jobs. I believe successful implementation of the Core would change that.

While there is much work that needs to be done and many changes need to be made, I am excited about the much brighter educational and employment outlooks for my students. Jumping into the Common Core math standards has made feel a part of something very big, and I feel the momentum is building. ■

Contact Lane at **lane.walker@fhsdschools.org** with any questions or comments.

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